Impact of weight loss after bariatric surgery on gonadic function in severely obese female adolescents

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OBJECTIVES

To better understand the short-term effects of consequent weight loss on ovarian function and the correlation with morphometric and metabolic changes at 1 and 2 years after a laparoscopic adjustable gastric banding (LAGB) placement in severely obese female adolescents.

SUBJECTS AND METHODS

Data for this observational study was retrospectively attained from the University Hospital of Lille from July 2015 to January 2016. Data from female adolescents who underwent LAGB between April 2011 and November 2015 were considered. Menstruations, anthropology and biological data were collected before LAGB (M0), at 12 months (M12) and at 24 months (M24) after surgery. Morphometric changes were calculated based on Body Mass Index (BMI), Excess Body Weight (EBW) and Excess Weight Loss (%EWL). Metabolic changes were described using homeostatic model assessment (HOMA) for insulin resistance; gonadic function parameters were age at menarche, cycle length and serum androgen levels (testosterone) in adolescents free from oral contraception.

RESULTS

Fifteen female adolescents were included in the study and data analyses were achieved on n=15 at M0 and at M12 and only n=9 at M24 for follow-up discontinuation (n=2) and LAGB timing (<2 years, n=4). Mean BMI, EBW and EWL before LAGB and during follow-up, are shown in table 1. Age at menarche was significantly younger in obese adolescents than that of their mothers (11.6 +/- 1.5 vs. 12.3 +/- 1.8 years old, p=0.05). The cycle duration decreased from 60.7 +/- 34.9 days before surgery to 26.0 +/- 3.4 days after surgery (p= 0.014). The cycle duration with no hormonal contraception positively correlated with BMI before surgery (r=0.687, p= 0.043). Neither insulin sensitivity (HOMA), nor testosterone level significantly changed at M12 and M24 but we noted a mild improvement of HOMA (3.6 at M12 vs 4.8 at M0).

Table 1: Morphometric characteristics of patients at M0, M12 and M24.
Age: Age at LAGB (years), BMI: Body Mass Index (kg/m2), EBW: Excess Body Weight (kg), cBMI: change in BMI (kg/m2), EWL: Excess Weight Loss (%), calculated from baseline

Table 1

	M0 (n=15)			M12 (n=15)			M24 (n=9)		
	Age	BMI	EBW	BMI	cBMI[12](**)	%EWL	BMI	cBMI[24](**)	%EWL
Min	15.0	33.0 (*)	21.9	30.8	- 1.5	- 6.3	31.2	-3.7	-29.4
Max	18.0	54.8	77.5	51.5	8.1	41.3	47.2	8.0	46.6
Mean	16.4	41.5	43.4	38.1	3.4	19.7	37.1	3.4	16.3
SD	0.9	6.0	16.4	6.1	2.6	14.1	5.4	3.5	21.0

(*) Initial IMC of this patient was 35 with diabetes mellitus

(**) Change in BMI cBMI is based on BMI of D0. At M12, $cBMI^{12}$= BMI(M12)-BMI(D0), At M24, $cBMI^{24}$=BMI(M24)-BMI(D0)

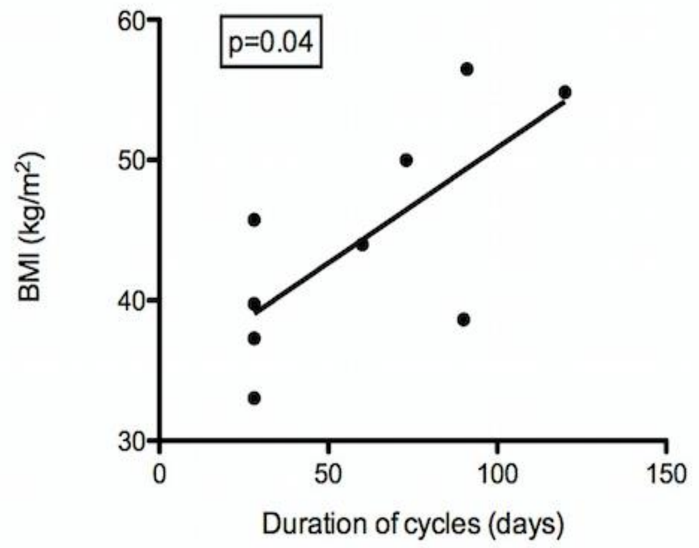

Figure 1: Correlation between cycle duration and BMI
Abscissa: cycle duration (days) ordinate: BMI (kg/m2)

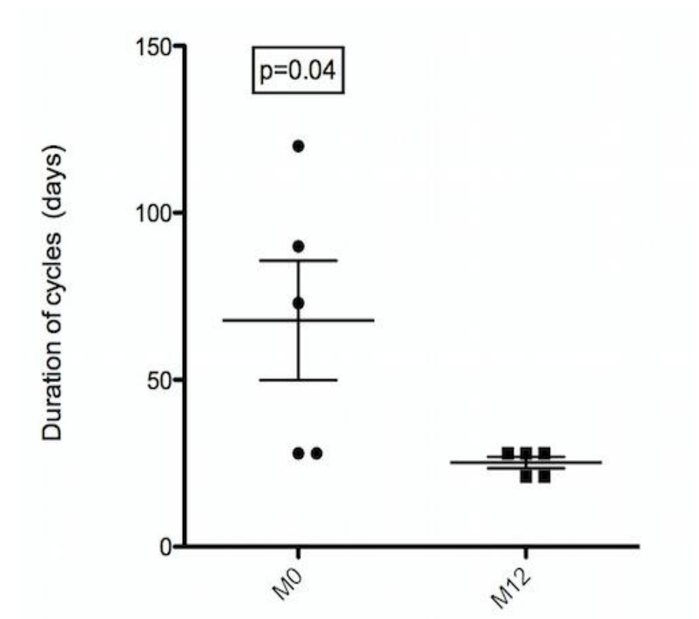

Figure 2: Evolution of cycle duration between M0 and M12
Ordinate: cycle duration (days)

CONCLUSION:

Consequent weight loss positively affects ovarian function by normalizing menstruation cycle duration in severely obese female adolescents, despite modest metabolic and hormonal changes.

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